

C/N ratios, $\delta^{13}\text{C}$, and $\delta^{15}\text{N}$ analyses of biomass from metal-limited nitrogen fixing cyanobacteria

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We grew *Anabaena variabilis* strains ATCC 29413 and 27893 in N-free media in continuous and batch cultures under Fe- and Mo-limited conditions. Results suggest that elemental and isotopic ratios vary with growth and N_2 fixation rates, controlled primarily by media metal concentrations. In heterotrophic growth experiments, carbon to nitrogen ratios varied from 5 to 7, except for higher C/N of up to ~8 in continuous culture and low-Fe low-Mo media. C/N ratios generally decreased with increasing growth rates and increasing nitrogen fixation rates, especially in Fe-limited experiments. Carbon isotopic ratios ranged from -28 to -24‰, increasing overall with increasing growth and nitrogen fixation rates. The exception was in Mo-limited experiments, where $\delta^{13}\text{C}$ decreased slightly with increasing Mo concentrations. Nitrogen isotopic ratios ranged over ~6‰, generally increasing with increasing growth and nitrogen fixation rates in both Fe- and Mo-limited experiments. Elemental and isotopic ratios of biomass from autotrophic growth experiments are currently being analyzed.